

Part II: Status of EMS Division Programs and Activities

Introduction

The Emergency Medical Services (EMS) Division of Public Health - Seattle & King County is dedicated to increasing survival and reducing disability from out-of-hospital emergencies in the county by providing the highest quality patient care in the pre-hospital setting. All EMS Division programs are designed to enhance this effort and are developed through strong partnerships with other EMS agencies in the region and innovative leadership in the emergency medical field. This section summarizes the major EMS programs and activities involving the EMS Division.

A. King County Medic One Program

The EMS Division administers the King County Medic One (KCM1) paramedic program, one of six Advanced Life Support (ALS) programs operating in the county. KCM1 employs over 70 paramedics and support staff, and provides emergency medical response to patients in the south



King County region (see Appendix B: Regional Map of the ALS Provider Areas). The KCM1 service area covers 544 square miles with a population of over 750,000 people. In the year 2003, KCM1 responded to nearly 12,000 dispatch-selected paramedic alarms in their primary service area, in addition to responding to mutual aid requests in neighboring jurisdictions.

Each day of the year, King County Medic One deploys seven full-time medic units. Each unit is placed strategically throughout the service area to minimize response times and maximize cost-efficiencies. KCM1 operates out of eight

satellite sites that include local fire department stations, KCM1 facilities, and a central office in the industrial area of Kent. KCM1 has 20 vehicles in their fleet and puts approximately 250,000 fleet miles on the vehicles each year. Medic units are staffed with two paramedics working 24-hour shifts and utilizing five area hospitals for medical direction.

Training Requirements: All King County Medic One paramedics are trained in the Paramedic Training Program at the University of Washington School of Medicine, based at Harborview Medical Center (HMC). Students develop their skills under the tutelage of experienced physicians, nurses, and Seattle Fire Department paramedics during the rigorous ten-month training course. As a condition of employment, all KCM1 paramedics are required to have a minimum of 100 hours of biannual continuing education in addition to skill levels testing that exceeds both Washington State and national standards. To meet this obligation, KCM1 provides

quality training through a number of in-house, on-duty educational opportunities. In addition, various required classes are available to paramedics, including three-hour, Harborview-based, UW School of Medicine continuing education classes each month. The training programs follow the path of logical and systematic progression from basic skills manipulation and knowledge testing to industry leading programs developed specifically for King County paramedics. Training efficiencies are obtained by rotating crews into headquarters for several hours of training every other month.

Educational Opportunities: Innovations to the King County Medic One program include the institution of a Grand Rounds Training (GRT) program that allows on-duty medics to train during their shifts at a central station. This model utilizes a team from the KCM1 program under the tutelage of the King County Medical Director, to teach paramedics new skills as well as provide training on high-risk/low-frequency skills and procedures. The following is a list of additional educational opportunities provided for KCM1: Tuesday Series (monthly paramedic education at Harborview), monthly pharmacology exams, advanced paramedic training courses such as Experienced Provider - Advanced Cardiac Life Support (EP-ACLS) and Pediatric Advanced Life Support (PALS), difficult airway lab, scenario or situation-based education using anatomical simulators, and local EMS conferences.

Special Services in the Community: Additional paramedic services are provided to the citizens of King County by staffing medic units for special events at the White River Amphitheater and the Pacific Raceways, and for major drills and exercises like the May 2003 TOPOFF weapons of mass-destruction event in Seattle, and other high-volume public activities. A paramedic 'Bike Team' has been developed for events where motor vehicle access is limited. KCM1 personnel also participate in regional BLS training, dispatch quality review and training, regional medical supplies and equipment purchasing programs, regional hospital, trauma and emergency preparedness committees, and vehicle replacement initiatives.

The King County Medic One program also has a long history of being involved in many local and national clinical studies. KCM1 is currently involved in the Omega-3 fatty acid study, a study of the relationship between diet and cardiac arrest, and the pre-arrival aspirin HASK study (see page 39). In addition, KCM1 is participating in a study investigating the use of 'hypertonic' IV solutions to determine whether concentrated saline improves outcomes from blunt trauma.

Administrative Structure: The King County Medic One administrative staff is configured to not only provide round-the-clock supervision and response back-up to the paramedic program, but to extend the 'reach' to include partner agencies in south King County. Representatives from KCM1 participate in regional planning and operations groups, including the King County Fire Chiefs, Training Officers, trauma councils, hospital and emergency preparedness. The following KCM1 positions provide liaison representation and expertise in these specified areas: Program Administrator, 24-hour Shift Supervisor, Operations Supervisor, Training Supervisor, and Emergency Management Supervisor.

King County Medic One remains one of the premier paramedic providers in the nation. Its high cardiac-arrest survival rate and superior customer service and customer satisfaction levels help

maintain its reputation and define its performance standard. The personnel who provide this core service are dedicated to public service at the highest level.

King County Medic One Donations: King County Medic One, like most paramedic providers, has a separate account for donations from citizens. These funds are used to supplement EMS levy funds and are specifically targeted to purchase equipment or support training of paramedics. The funds are kept separately from the EMS levy fund. In 2003, KCM1 received 61 donations. The majority of donations received are under \$100. In 2003, there were two larger donations (approximately \$50,000 and \$98,000), and fifty-nine smaller donations ranging from \$10 to \$1,000 averaging \$72 per donation.

In 2003, donated funds were used to purchase laryngoscopes, capnography, bullet proof vests, and a laptop computer to support paramedic training continuing education. The fiber optic laryngoscopes upgraded existing equipment and allowed paramedics to better intubate (placement of a tube for the patient to breath through) patients with compromised airways. The electronic capnography was a software and hardware upgrade to the current defibrillators. It allowed for measurement of exhaled carbon dioxide from both intubated and non-intubated patients and permits paramedics a secondary means of assessing endotracheal tube placement, ventilation rate, and a quantitative measurement of carbon dioxide. These two items help to insure the patient is well ventilated and oxygenated.

KING COUNTY MEDIC ONE DONATIONS

Fund 6980; SubAccount 06204

2003 Account Balance

Beginning Balance Account	\$ 214,483.20
Donations through 12/11/03	\$ 155,841.22
Expenditures	<u>\$ (90,582.11)</u>
Ending Balance	\$ 279,742.30

B. 2002 - 2007 Strategic Initiatives

IN PROGRESS

The Emergency Medical Services system in King County provides an outstanding public service to its citizens. The EMS Division coordinates development of the regional strategic plan in conjunction with EMS providers, partners in providing EMS services, and elected officials to help maintain this high quality public service.

The *2002-2007 EMS Strategic Plan Update* supports both currently implemented programs and the development of new projects in order to meet identified objectives characterized as 'strategic directions.' The EMS Strategic Directions consist of the following:

- Enhance existing programs and add new programs to meet emerging community needs to maintain or improve current standards of patient care.
- Manage the rate of growth in the demand for EMS services.
- Use existing resources more efficiently to improve operations of the system to help contain costs.

The *2002-2007 EMS Strategic Plan Update* developed a cohesive, broad reaching, long-term plan for the region, however, a more detailed vision of how these directions might be implemented was necessary. In late 2003, the **2003 Supplemental Plan** was created following a thorough process of review and discussion by EMS Division senior staff, the EMS Advisory Committee, and EMS agency representatives. During this process of review, several broad themes emerged, including the following three areas of interest:

- Dispatch Enhancements
- Advanced Technology Projects
- EMS System Efficiencies

The term 'strategic initiative' was introduced in the *1998-2003 EMS Strategic Plan* and used almost exclusively to describe a handful of new and innovative approaches to improving the EMS system in King County, including the Regional Purchasing Program (see page 36) and the Review and Revision of the Criteria Based Dispatch (CBD) ALS Triage Criteria (see page 22). These twelve strategic initiatives were allocated specific funds to ensure their successful implementation and were completed in 2002.

The *2003 Supplemental Plan* continued in this manner by supporting the continuation of projects already in progress and identifying new programs that are thought to have a significant impact on the success of the Strategic Directions. The current set of strategic initiatives were again allocated dedicated funds to ensure adequate financial support. In June 2004, the EMS Advisory Committee amended the plan and approved additional Strategic Initiative funding for enhancements to the Web-based Training for EMS Personnel, Paramedic and EMT Procedure and Patient Treatment Evaluations, Enhanced Care for Specific EMS Patients projects and EMS Levy Planning for 2007, and the newly developed Regional EMS Tracking Resource - Online (RETRO) Project.

I. Dispatch Enhancements

As indicated in the *2002-2007 EMS Strategic Plan Update*, dispatch is the access point to emergency medical services and thus 'plays a critical role in managing the use of the high cost advanced life support (ALS) resources'. Strategic Initiatives that invest in the training and education of dispatchers and enhance quality improvement practices are expected to improve the effectiveness and efficiency of ALS dispatch. The following section describes the three major dispatch-related Strategic Initiatives.

Continued Review and Revision of the Criteria Based Dispatch (CBD) ALS Triage

Criteria: One of the Strategic Directions identified in the *1998-2003 EMS Strategic Plan* and supported in the *2002-2007 EMS Strategic Plan Update* was to determine ways to decrease the rate of growth of ALS calls in the EMS system. A major component of this effort was the revision of the Criteria Based Dispatch (CBD) Guidelines that determined if ALS care was required.

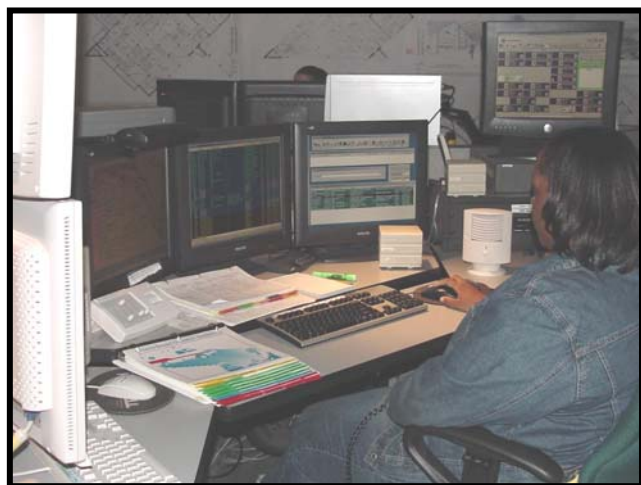


During the year 2000, the EMS Division implemented comprehensive revisions to the CBD Guidelines. A comparative analysis was conducted in 2002 to measure the impact of the 2000 CBD Guidelines revisions. As a result of the findings in the evaluation of the 2000 CBD Revisions, the EMS Division concluded that ALS was less likely to be dispatched during 2001 compared to

1999. Results showed that overall, ALS was dispatched on 32.9% of EMS responses during 1999 and 28.9% of responses during 2001. If the observed decrease had not occurred, there would have been approximately 3,800 additional ALS dispatches during 2001.

In 2003, the EMS Division and the King County Dispatch Review Committee conducted a subsequent review of the CBD Guidelines. These revisions were approved by the King County Medical Directors in November 2003. Training for dispatchers, EMTs and paramedics was conducted in the spring of 2004. The Fourth Edition of the King County CBD Guidelines was implemented at all dispatch centers in King County, outside the city of Seattle, on June 20, 2004. These revisions were relatively minor and the significant reductions in ALS response observed after the year 2000 changes are not anticipated.

EMD Quality Improvement: The development of an Emergency Medical Dispatch Quality Review Program is an integral part of the *2002-2007 EMS Strategic Plan Update*. In 2001, the EMS Division in cooperation with King County Dispatch centers, began a formal process for



Eastside Communications Center

review of dispatch tapes and associated EMS reports for the purpose of EMD quality improvement. As of June 2004, approximately 2,900 cases have been reviewed. The process includes 1) identification of cases meeting particular review criteria, 2) retrieval of dispatch tapes and reports from the dispatch centers, and 3) review of these cases by a team consisting of a paramedic and a dispatcher. Feedback from this case review is provided to the individual dispatcher, when appropriate, and is also used in continuing education when systemwide trends for improvement are identified.

Enhanced CBD Basic Training and Continuing Education Curricula: A priority for enhanced dispatch training included revisions to both Basic and Continuing Education training in Criteria Based Dispatch. Two major changes to this training occurred between July 2002 and June 2004.

1) *Addition of Pre-course Anatomy and Physiology Class:* Dispatch improvements continue to focus on expanding and creating enhanced training for Emergency Medical Dispatchers (EMD). A pre-requisite course of Anatomy and Physiology is currently in the pilot stage and is a requirement prior to attendance in the Basic Criteria Based Dispatch course. This 8-hour class provides the dispatcher with a basic understanding of human anatomy and physiology. The Basic CBD course continues to provide the students with a review of anatomy and physiology, including aspects of pathophysiology. The objective is to provide EMDs with additional medical training to enhance their good decision-making skills.

2) *Problem/Scenario-Based Method of Delivery:* One of the main projects for 2004/5 is to update and revise the method of training delivery in the Basic EMD Course to include more student-centered learning activities such as problem-based scenarios, role-playing, and other methods that involve students in the learning process. Continuing Education courses were revised to include this format in 2003. Instructors in the program are now required to attend a revised EMD Instructor Recertification workshop.

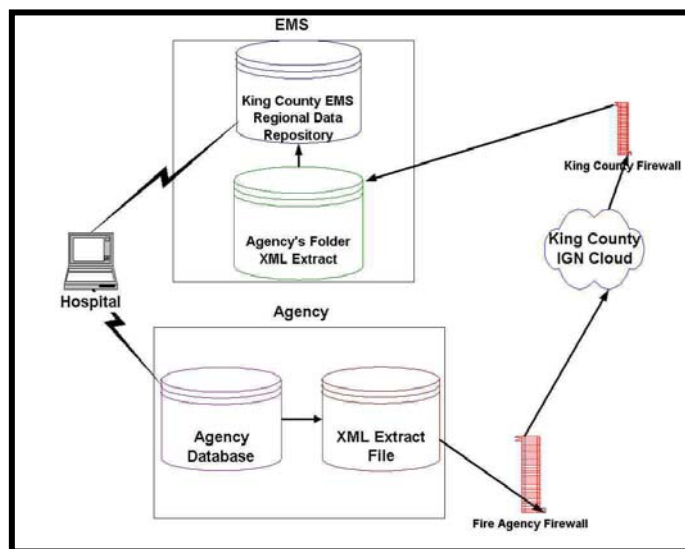
The first EMD Instructor Recertification workshop topic was 'Problem-based Facilitation Skills and Adult Learning.' The objective for this training was to provide instructors with information about the change in the method of delivery from those they have used in the past (lecture to more scenario/problem-based). The curriculum consists of carefully selected and designed problems that demand from the learner acquisition of critical knowledge, problem solving proficiency, self-directed learning strategies, and team participation skills. Studies have shown that participants are able to apply the knowledge and seek out information more effectively than those students receiving the lecture-based method.

3) *Online Web-based Training:* In June 2004, the first module of web-based continuing education was delivered to dispatchers. The topic was Cardiac Arrest/Dispatcher-Assisted Telephone CPR. The training was a 90-minute web-based module followed by two hours of classroom discussion and question and answer period with instructors. More information on this project is provided in the next section.

II. Advanced Technology Projects

The development of projects that incorporate advancements in technology offers a variety of opportunities for improved efficiencies in the EMS system. This includes electronic data collection, on-line training of personnel, and electronic record-keeping. Current technologies allow for rapid and direct communication between EMS agencies, accurate and secure transmission of information, and simplified management and oversight of EMS activities. The following section describes the three major technology-related Strategic Initiatives.

Regional Electronic Data Collection Project: One of the Strategic Initiatives identified in the *1998-2003 EMS Strategic Plan* and supported in the *2002-2007 EMS Strategic Plan Update* was the development of an enhanced EMS monitoring system that would allow for improved oversight of the EMS system. The



Regional Data Collection (RDC) Project was a five-year countywide effort to implement a system that allowed for electronic collection and distribution of EMS data. The goal of the project was to enable all EMS providers in King County to complete an electronic version of the Medical Incident Report Form (MIRF) and electronically transfer that report directly to the central EMS database. The collection and consolidation of data via electronic means improves the accuracy and completeness of the data, provides access to the aggregate data by individual service providers, allows for

more intensive analysis of the data and facilitates the assembly of system reports.

The RDC Project was completed as a pilot project in December 2003 and integrated into the regular programs and activities within the EMS Division. Project accomplishments include:

1. Establishment of a defined standardized EMS data set.
2. Review of the data management system and selection of appropriate design changes.
3. Establishment of a central data server with network connectivity to participating agencies.
4. Development of a pathway for the electronic transfer of data.
5. Development of a method for electronic access to aggregate data by agencies.
6. Completion of the project using 66% of the allocated budget.

There are currently sixteen EMS agencies collecting data electronically across King County, including Auburn Fire Department, Bellevue Fire Department, Federal Way Fire Department, Fire District #40, Kent Fire & Life Safety, Kirkland Fire Department, Maple Valley Fire & Life Safety, Mercer Island Fire Department, North Highline Fire District (#11), Port of Seattle Fire Department, Redmond Fire Department, SeaTac Fire Department, Seattle Fire Department, Shoreline Fire Department, Woodinville Fire and Life Safety, and Vashon Fire & Safety. These departments represent 69.6% of the forms generated in a year. Three additional agencies are expected to begin electronic data collection by the end of 2004, increasing electronic reporting by EMS agencies to 80.5%.

In all cases of data collection and transfer, the strictest policy of patient confidentiality is maintained. This includes utilization of secured methods for data transfer and limited access to

confidential information. In accordance with the Washington State Uniform Health Care Information Act (RCW 70.02) and Health Insurance Portability and Accountability Act (HIPAA) regulations, the EMS Division is evaluating any possible additional areas for improvement.

As a subset of the Regional Data Collection Project, the **Alternate Input Device (AID) Pilot Project** is evaluating the implementation of a custom-designed, fully electronic medical incident report form (E-MIRF) installed on tablet devices for use in the field. Phase I of the AID Project sought to design an early E-MIRF prototype and test the software on a variety of tablets.

This portion of the project was completed in March 2003. A final report was presented at the EMS Advisory Committee meeting in June 2003 and the committee approved the AID Project Oversight Committee recommendations to develop and implement Phase II. Phase II of the AID Pilot Project will continue to evaluate hardware and software solutions for electronic data collection in the field. The AID Oversight Committee recommended the following focus areas for Phase II:

The screenshot displays the E-MIRF software interface. At the top, there's a title bar and a menu bar. Below the menu bar, there's a toolbar with icons for various functions. The main form area contains several sections for data entry. The first section includes fields for Date of Incident (05/28/2004), Agency Incident Number (12345678), Agency Name (Shoreline FD (17D04)), Street Number (45321), Street Name (Sunnycrest), Street Type (Road), Street Suffix (Apt), and Apartment. The second section includes fields for City (Renton), State (WASHINGTON (WA)), ZIP (98059), County (King), Last Name (Test), First Name (Case), Middle Name (), Date of Birth (5/28/1966), Age (38), and Sex (Male (M)). The third section includes fields for Street Number (45321), Street Name (Sunnycrest), Street Type (Road), Street Suffix (Apt), and Apartment. The bottom section includes a Recognize Handwriting button and a section for Clear Handwriting & Results, with options to Choose & Replace Value in Field, Choose & Append Value to Field, Clear Selected Field, Jump to Previous Field, and Jump to Next Field.

- Update and modify the software product based on feedback from Phase I.
- Purchase one tablet type for continued testing of the software product and develop hardware specification for future hardware purchases.
- Enhance utilization of the tablets with improved handwriting capabilities, retention of data, printing capabilities, and an ability to export to the King County data standard.
- Continue evaluation and possible implementation of second priority items such as connectivity to CAD (dispatch), transfer of data between tablets, and integration with local agency RMS systems.

The consulting firm that developed the original E-MIRF in Phase I completed the recommended changes to the software in July 2004. The form is expected to be available for evaluation by EMS agencies in September 2004. Pilot testing in the field is expected to last three to six months and includes the following EMS agencies: Bellevue Fire Department (FD), Federal Way FD, Kent FD, SeaTac FD, and Shoreline FD.

Web-based Training for Dispatchers, EMS Personnel, and AED Users: Development of training programs that utilize current web-based technologies allows for expedient and cost-efficient delivery of training services for dispatch, EMS personnel, and other targeted public populations.

The web-based training Strategic Initiative targets the development of new basic and continuing education modules for dispatchers and ongoing development of continuing education modules

for EMTs. This method of delivery allows project participants an opportunity to log onto the Web and access training modules during non-peak service hours and receive training in intervals that best meets the needs of the participant. Lessons are interactive with a focus on application of the objectives and include a participant feedback mechanism built into the lesson plan allowing students immediate response on both test questions and scenario responses.

A proposal requesting additional Strategic Initiative funds for the development of the next phase of the web-based EMS personnel training project was reviewed and approved by the EMS Advisory Committee in June 2004. Enhancements include the addition of streaming audio/video options, additional interactive content, and improved access to training records by local agency administrators. Please refer to page 35 for more details on the web-based training for EMTs.

Another web-based teaching module was developed to provide Automatic External Defibrillator (AED) training for senior citizens. A pilot study enrolling seniors from King County senior centers was undertaken to determine the best means of teaching AED skills using the Internet. This pilot study has led to a grant funded by the National Heart, Lung, and Blood Institute.

III. EMS System Efficiencies

The Emergency Medical Services (EMS) system provides an internationally regarded regional service to the citizens of King County. However, improvements and innovations regarding the management and financing of the four levy-supported ALS, BLS, Regional Services and Strategic Initiative sub-funds, review of EMS standards of practice, continuation of injury prevention programs, and analysis of particular EMS sub-populations that could benefit from enhanced care are integral to the provision and maintenance of any high quality EMS system.

The following section describes the five major efficiency-related Strategic Initiatives:

Financial Review of EMS Sub-Funds: The EMS levy in King County provides full support for Advanced Life Support (ALS) services, Regional Services, and Strategic Initiatives, and contributes to Basic Life Support (BLS) services. When the *1998-2003 EMS Strategic Plan* was updated, a committee of elected officials, representatives of cities and unincorporated areas reviewed each of these sub-funds extensively. This review process was useful in identifying areas for improvement, assisting in the prioritization of projects, and providing flexibility in responding to program needs.

Quality review of the EMS levy funding contributes indirectly to all three directions in the strategic plan by supporting programs that reduce ALS call volumes, highlighting program efficiencies, and advocating for innovative program practices. The review process educates decision-makers on how funds are being spent and allows the system to assess the services provided in each of the sub-areas. This review strengthens the regional system's ability to allocate funds, target areas of greatest need, and support areas that produce efficiencies or increase the system's effectiveness.

ALS Sub-Fund: As recommended in the *2002-2007 EMS Strategic Plan Update*, ALS funding is evaluated periodically to minimize cost shifting to ALS providers. Each year, a subset of the EMS Advisory Committee meets to review current and projected ALS costs and compares these to the current ALS allocation. Significant cost drivers leading to this recommendation included rising labor costs associated with recently settled union contracts, and increased costs of medical supplies.

Based on individual agencies experience, an increase above CPI was recommended and implemented for 2003 (5.5% above CPI) and increases of 2.1% above CPI are currently budgeted for 2005 and 2006. Please see page 56 for more details. The advantage with two smaller increases rather than one projected larger increase would be to better meet the cash flow needs of ALS providers. This will be reviewed by the ALS Subcommittee prior to finalizing contracts for 2005.

BLS Sub-Fund: The mechanism for allocating the BLS fund to individual EMS agencies uses a complex formula reflecting agency contributions in assessed valuations, percent of unincorporated area in the jurisdiction, and the number of EMS responses. The formula also incorporates the principle that no agency will receive less funding than the previous year, a concept known as 'holding harmless.' The BLS funding formula was revised in 2002 to address the soaring hold harmless amounts and to provide a more standardized method for defining formula elements. A key element of the revision process was a commitment on the part of the EMS Division to review and evaluate the formula on an annual basis to ensure it was operating as expected.

The BLS Subcommittee convened in May 2004 to review the 2005 BLS allocations and evaluate the status of the hold harmless amount. Two minor adjustments to the BLS funding formula were recommended to maximize reduction of the hold harmless amount, in addition to continued annual review of the BLS funding formula.

Regional Services Fund: The EMS Division began review of the current Regional Services Program budget in early 2004 as part of the King County 2005 budget preparation. Like other city and county departments, Regional Services faced challenges in increased overhead allocations. Along with cooperation from the Public Health Department itself, these increases were met through the utilization of small program reductions and rebudgeting. These changes permit the Regional Services Fund to stay within its CPI allocation. These proposals were reviewed and approved by the EMS Advisory Committee in June 2004.

Strategic Initiative Fund: Although the *2003 Supplemental Plan* provided adequate detail for the development and implementation of the current EMS Strategic Initiatives, project plans evolved to better reflect intended project objectives. Proposals for changes to the Strategic Initiatives were presented and approved at the EMS Advisory Committee in June 2004.

Paramedic and EMT Procedure and Patient Treatment Evaluations: Provision of the highest level of patient care is the primary objective of the EMS program in King County. Ongoing review of paramedic and EMT procedures and patient treatment plans is essential to maintaining a quality EMS system.

The following items represent the variety of areas pursued as part of this strategic initiative:

Pulse Oximetry: In the last year, EMT pulse oximetry was evaluated and is now an approved EMT procedure in King County. This non-invasive procedure provides a measurement of oxygen saturation and can be helpful in the assessment of patients with respiratory complaints.

Glucometry: Another EMT skill evaluated in the last year includes glucometry. This minimally invasive procedure provides rapid measurement of blood glucose levels and can be helpful in the assessment of patients with an altered level of consciousness. The evaluation concluded that no harm came to patients as a result of the procedure and appeared to enhance the efficiency of the EMS system. As a result, EMT glucometry is now an approved procedure in King County.

Emesis in Cardiac Arrest: Some evidence exists that excessive ventilation during cardiac arrest may lead to emesis. In order to see if this is a problem in the EMS system in King County, measurements of cardiac arrest associated emesis, including when the emesis occurred, is being conducted. Depending on the results, corrective steps may be made in the training of bag-valve mask ventilation.

A proposal requesting additional Strategic Initiative funds to support the development of these types of projects was reviewed and approved by the EMS Advisory Committee in June 2004. These funds will be used to carry out further reviews and evaluations of EMS procedures and patient treatment plans.

Injury Prevention and Public Education on the Use of 9-1-1:

Unintentional injuries are the leading cause of death for people of all ages! Injury prevention focuses on four approaches: Education, Environment, Engineering, and Enforcement to reduce injuries. The goal of the injury prevention and public education unit is to reduce 9-1-1 calls by reducing unintentional injuries. Among children ages 5 to 9, motor vehicle occupant injury is the leading cause of unintentional injury-related death, followed by pedestrian injury, drowning, fire and burns, and bicycle injury. Teenage drivers are the highest risk age group and are five times more likely than older drivers to crash. Falls are a leading cause of injury and death to older adults 65 years and older. More than one-third of all adults aged 65 and older fall each year.

Injuries are preventable! The following programs were designed to address specific high risk populations to help reduce injuries: **Smart Kids! Safe Kids!** - a pre-school fire & injury prevention program, **Think Again** - an education program for high school students that discusses the consequences of drinking and driving, **Child Passenger Safety** - an education program for the public that demonstrates how to correctly install child car seats, **Fall Factors** - a fall prevention program for older adults, **Randomized Fall Pilot Study** - a research project designed to test the fall factors procedures, **Special Community Events** - fire department and corporate supported community events with injury prevention themes.

With the successful implementation of the **Smart Kids! Safe Kids!** curriculum, topics such as burns and scaldings, pedestrian safety, helmet safety, and poison safety are discussed. A one-day workshop for early child educators (i.e. preschool teachers, Head Start, daycare providers, fire and life safety educators) was held in March 2004.

The event was sponsored by the EMS Division, Region 4 Life Safety Council, King County Fire and Life Safety Association (KCFLSA), BIC Corporation, Fire Proof Children, Pierce and Snohomish Safe Kids, Central Region Trauma and EMS Council, and the Puget Sound Education Service Districts. The workshop was held at the Shoreline Conference Center in Shoreline and video conferencing was made available in the Wenatchee and Olympia Educational Service Districts for other educators. The workshop was extremely successful. There were over 200 participants from 15 counties throughout the state of Washington, representing over 185 agencies. It is estimated that there is a potential to reach over 7,000 children with valuable fire and injury prevention education and participants learned the importance of providing these lessons throughout the school year, rather than once a year during fire prevention week.



Seattle Fire Department

The **Think Again Program** is sponsored by the EMS Division, Washington State Traffic Safety Commission (WTSC), and the King County Fire & Life Safety Association (KCFLSA). The KCFLSA has set goals to reach our most vulnerable young adolescents using the Think Again classroom presentation targeting 15-19 year olds. Local and national statistics indicate that motor vehicle crashes are the leading cause of injury and/or death for adolescents. All too often these preventable crashes involve reckless driving, lack of seatbelt use, and the use of alcohol and/or drugs.



King County Fire & Life Safety Association

Many fire departments in King County participate in Think Again, but only four local agencies applied for funding of the program for 2004: Eastside Fire & Rescue, Kirkland Fire, Kent Fire Department, and King County Fire District #40. Participating fire departments received a total of \$6,800 in grants from the Washington Traffic Safety Commission (WTSC) and the EMS Division for the year. Additional participating departments include: Auburn, Bellevue, Bothell, Federal Way, Maple Valley, Northshore, Redmond, Shoreline, and Woodinville.

The Think Again program was presented to 4,400 high school students in 2003 and has reached over 35,000 students in King County schools since the program began in 1998. Since the inception of the Think Again program, the number of injuries and/or deaths in King County has dropped by one-third. The Think Again program has been recognized over the years by the WTSC Superstar Award in Educational Outreach and M.A.D.D. Washington State in Outstanding Community Education.



Washington State Safety Restraint Coalition

The **Child Passenger Safety (CPS) Program** took a giant step forward when it received approval by the Public Health - Seattle & King County Director's Office, allowing employees to participate in Child Passenger Safety activities. A pilot project at the Federal Way Public Health Clinic has proven to be a valuable tool in educating Public Health providers as well as WIC patients in properly installing child car seats. On the second Thursday of each month, child passenger safety classes are offered to WIC patients and taught by NHTSA Certified Passenger Safety Technicians. These classes are offered in English, Spanish and Ukrainian, and when possible, child car seats are provided to needy families. This model Child Passenger Safety Program is slowly being expanded to include other Public Health Centers, such as the Springwood Public Health Center. In addition, various CPS car seat check-up events are conducted throughout the county with local fire departments, AAA of Washington, and the Washington State Safety Restraint Coalition.



Fire District #40

The **Fall Factors Program** involves multiple agencies and fire departments that conduct free home and patient assessments of fall hazards, and appropriately installs free fall reduction devices in the homes of low-income seniors. Examples of fall reduction devices include tub grab bars, hand held showers, transfer benches, toilet seat risers and frames, bed assist frames and others.

To date the program has assessed a total of 1,070 homes of participants in the Fall Factors Program since the program's inception in 1996. Over the life of this program, it is estimated that this program may have saved approximately \$300,000 in Medicare hospital costs by reducing future falls of people over 65 years old.

A randomized falls pilot study, started in the Bellevue Fire Department service area in 2003, has been expanded to include other areas of the county. This program will continue to be supported until approval from a National Institutes of Health (NIH) grant is received for a larger fall prevention study, hopefully in mid-2005.

Each year, the EMS Division participates in fire department and corporate-supported **Special Community Events**. This year, the division participated in the 'Fire Department Day at the Boeing Flight Museum' event, providing free child car seat check-ups and reduced-price bicycle helmets. This regional event involved fourteen fire departments participating in the education of preschoolers and elementary school students regarding fire and injury prevention.

Enhanced Care for Specific Populations: Although the management of emergency medical services usually includes the development and implementation of programs that target a unique subset of EMS patients, highlighting these programs does not often occur. Providing a focal

point for the development and implementation of programs that target specific users of EMS will provide more appropriate patient care and contribute to the overall efficiency of service delivery. This Strategic Initiative was approved by the EMS Advisory Committee in June 2004 to receive additional Strategic Initiative funds to support the development of these types of projects. The following items represent the variety of projects pursued as part of this strategic initiative:

Nursing Home/ Adult Family Facilities: The Community Programs and Education Section in the EMS Division has identified an area in which community education in nursing homes and adult care facilities would result in better, more efficient use of Advanced Life Support (ALS) resources. In coordination with the ALS providers in the county, an educational video and job aide was developed for delivery to health care providers working in these types of facilities. The objective of the training is to reduce unnecessary requests for ALS services from nursing homes, adult care facilities, and medical clinics. Several educational sessions were piloted in June 2004. It is expected that the pilot will be completed by the end of 2004 and evaluated in 2005.

Cardiac Arrest in Dialysis Centers: A joint study with Seattle Medic One was undertaken in 2004 to evaluate the incidence of cardiac arrest in dialysis centers and suggest strategies for improving survival rates.

Cardiac Arrest in Children less than 8 Years Old: An epidemiologic study was undertaken to decide if children less than 8 years old should receive an assessment of rhythm by EMTs using an AED or receive continued CPR until paramedics arrive. Preliminary results suggest that children from 1-8 years old who have a witnessed cardiac arrest should have an AED placed and a defibrillatory shock provided if indicated.

End of Life Decisions: Special emphasis will be placed on creating a single policy for managing end of life decisions among patients in cardiac arrest for whom EMS is called.

Assessment of the Impact of State Budget Cuts on the EMS System: The recent financial crisis in Washington State has created unprecedented budget cuts to critical health care programs for children and families. This affects support of the Basic Health Care program, Medicaid reimbursements, and a variety of other resources. The EMS Division has started to evaluate the impact of these cuts on access to and use of the EMS system in King County. Evaluation activities include an examination of the prevalence and severity of selected medical conditions treated by EMS personnel. In addition, EMS will analyze the relationships between demographic factors and changes in conditions over time.

Regional EMS Tracking Resource - Online (RETRO) Project: Ensuring that EMS personnel meet the State and King County certification and recertification requirements is critical in maintaining or improving current standards of patient care. The RETRO Project is a newly approved Strategic Initiative to build a centralized database to track and store information related to EMS personnel. Development of the database will enhance the existing EMS agencies' program of tracking the educational requirements of EMS personnel.

Types of EMS personnel records include: dates and requirements related to certification and recertification, reciprocity requirements, and teaching certification requirements. The multi-systems database will collect and track information for each EMS individual entering into the EMS system in King County and eliminate the intensive, time-consuming use of paper files. A proposal requesting the Strategic Initiative funds to support the development of the RETRO database was reviewed and approved by the EMS Advisory Committee in June 2004.

IV. Strategic Planning for Next EMS Levy Period

The *2002-2007 EMS Strategic Plan Update* to the *1998-2003 EMS Strategic Plan* outlines the operational and financial recommendations for the 2002-2007 funding period. A copy of the full report is available online at <http://www.metrokc.gov/health/ems/> or by contacting the EMS Division (see Appendix G: EMS Division Contact Information).

Development of a Strategic Plan for the next EMS levy period will require significant coordination and collaboration with EMS agencies and elected officials in King County. Identifying this as a separate strategic initiative with associated funds will expedite the process and early project planning is expected to begin in late 2004.

Discussions regarding all aspects of the EMS system, including ALS services, BLS services, Regional Services and Strategic Initiatives will begin in early 2005. A final document for delivery to the King County Council is expected in late 2006. This plan includes a request for additional Strategic Initiative funds and the EMS Advisory Committee reviewed and approved the proposal in June 2004.

The table below summarizes the status of each strategic initiative and is followed by brief project descriptions.

2002-2007 Strategic Initiative - Summary Table

Strategic Initiative	Current Status
I. Dispatch Enhancements:	
Review and Revision of the Criteria Based Dispatch (CBD) ALS Triage Criteria	Ongoing
EMD Quality Improvement	Ongoing
Enhanced CBD Basic Training and Continuing Education Curricula	Ongoing
II. Advanced Technology Projects:	
Web-based Training for EMS Personnel and Dispatchers*, and AED Users	Ongoing
Continuation of the Regional Electronic Data Collection Project	Incorporated into Regional Services: 12/03
III. EMS System Efficiencies:	
Financial Review of EMS Sub-Funds	Ongoing
Paramedic and EMT Procedure and Patient Treatment Evaluations*	Ongoing
Injury Prevention Programs	Ongoing
Enhanced Care for Specific EMS Patients*	Ongoing
Assessment of the Impact of State Budget Cuts on the EMS System	Initial Development Phase
Regional EMS Tracking Resource - Online (RETRO) Project*	Initial Development Phase
IV. Strategic Plan*	

* Approved by the EMS Advisory Committee as a new or enhanced project (June 2004)

C. EMS Division Programs and Activities

Introduction

In addition to the specific Strategic Initiative projects outlined in the *2003 Supplemental Plan*, the EMS Division plays a significant role in developing, coordinating, managing, and evaluating many EMS programs throughout King County. These programs provide the necessary regional cohesion to ensure that the standards for pre-hospital patient care are met by the 9-1-1 dispatchers receiving calls for medical assistance and by the EMTs and paramedics responding to the scene. The importance of developing and supporting regional programs is often underemphasized. The following section describes the many varied programs managed by the EMS Division.

I. Basic Life Support (BLS) Training and Education Program

Helping you become the best through Training and Education!

The **Basic Life Support (BLS) Training and Education Program** provides initial training, continuing education, and oversight of the recertification process for over 4,000 Emergency Medical Technicians (EMTs) in King County. This requires considerable coordination and communication between the BLS Training Section staff and EMS agencies to ensure that training and education programs meet agency needs as well as State of Washington requirements. In addition, the training section serves as the liaison between the State Department of Health and the thirty-four fire/EMS agencies in King County. In this capacity, the section provides EMS agencies all pertinent information from the State regarding continuing education, certification, recertification, and regulatory and policy changes.

The following **BLS Training and Education Projects** highlight activities for 2004:

Patient Care Guidelines: The protocols used by EMTs to direct the pre-hospital care of patients are derived from the Patient Care Guidelines (PCG). The EMS Medical Program Director (MPD) is required by Washington Administrative Code (WAC) to draft and distribute these guidelines to all EMTs in King County. In 2003, the patient care guidelines were updated by a committee of EMS providers from around the County in collaboration with the MPD, and distributed throughout the County. They were also placed online so changes could be rapidly communicated to EMS personnel.

The PCG are again under revision in 2004 for a January 2005 distribution. The new look and design will for the first time allow each EMT in King County to place this valuable resource tool literally in their front pocket. This compact version of the Patient Care Guidelines is designed to provide easy access to pertinent patient care information. The EMS system in King County is considered a national leader in EMS research and education, and as such, is committed to updating and distributing the PCG every two years to incorporate new and innovative techniques that EMTs can incorporate into overall patient care.

Initial Training Classes for EMTs: Two initial EMT training courses are offered in the spring and fall of each year. These classes are open to personnel from all thirty-four King County fire agencies. Seattle/King County Police and King County Search and Rescue applicants are also permitted to participate in this educational opportunity. Each course consists of 120 hours of classroom and practical instruction, in addition to 10 hours of hospital observation time, and utilizes the U.S. Department of Transportation EMT-Basic curriculum. In 2004, over 120 EMTs completed the EMT basic course.

Competency Based Training (CBT): Each year, the State of Washington mandates that EMTs complete ten hours of continuing medical education or a county-approved program of continuing medical education and evaluation. In King County, the topics are prescribed by the medical program director and include five annual modules on various emergency medical topics, a total of 15 modules in a three-year recertification cycle. In



aggregate, this program is referred to as Competency Based Training (CBT). The BLS Training staff develops, writes, and implements the curriculum each year. Additionally, the staff also reviews and performs final draft summaries of all developed curriculum within the Training Section. The 2005 Competency Based Training curriculum is currently being developed for the following selected topics: Orthopaedic Injuries, Respiratory Emergencies, OB/GYN Emergencies, Behavioral Emergencies, Environmental Emergencies, and Infectious Disease (infectious disease is a yearly requirement).

The **CBT Online Training Website** that delivers the web-based CBT modules was developed for the first time in 2001 with the assistance of grant money from the Medic One Foundation. Eighteen modules are now available online with 4,056 EMTs enrolled in the program, 100% of the EMTs in the county. Over 32,000 courses have been completed, resulting in a dramatic reduction of CBT training costs to agencies since web-based training is approximately \$18/EMT per year and standard classroom instruction is approximately \$133/EMT per year.

The online CBT curricula are designed for EMTs to study the subject in an interactive format, including realistic video case studies (produced by BLS Training staff) with complete online evaluations. The test results are automatically stored in an electronic database for centralized record keeping and reporting to county fire departments and EMS agencies. Each module has a practical skills evaluation conducted by an onsite instructor to ensure clinical skills meet County standards. BLS Training staff provide technical support for the website and support an instructor hotline for questions about the modules and treatment protocols. The website is currently being revised for 2005 curriculum and will add improvements to this state-of-the-art training system including improved interactivity and advanced reporting features.

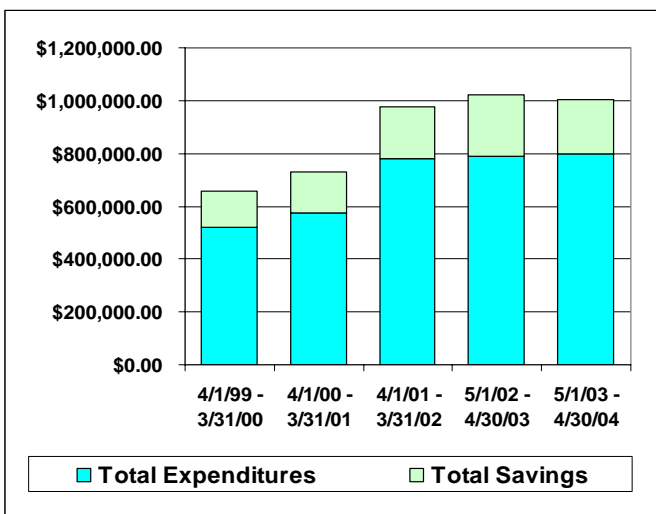
The CBT Online Website was presented to the Washington State EMS and Trauma Licensing and Recertification committee in June 2003 and was approved for use in EMT continuing education. Additionally, the King County MPD and BLS Training Supervisor presented the CBT Online Website at the annual Washington State MPD symposium and received strong support for program innovation and excellence. A number of county MPDs expressed a high degree of interest in expanding the King County CBT Online program into other counties and throughout the state of Washington. The site earned high praise from the committee as an innovative and cost-effective method of delivering EMT continuing education. The on-line CBT program is slated to open statewide in January 2005.

Early Defibrillation Program: The goal of the Early Defibrillation Program is to resuscitate the greatest number of people in cardiac arrest using a comprehensive plan that includes initial defibrillation training, continuing medical education, field documentation and reporting, equipment maintenance procedures, and quality assurance activities. The Early Defibrillation Procedures Manual was revised in 2003 to reflect new scientific understandings in resuscitation, including the standing orders for cardiac resuscitation.

Beginning in 2005, the EMTs in King County will enter into a new study to collect scientific evidence regarding the relationship and quantity of CPR and use of Automated External Defibrillators (AEDs). Quality assurance is a high priority within the AED Defibrillation Program. All resuscitations that occur in King County are evaluated in detail and the information gathered is used to provide timely feedback to each individual EMT and their training officers. In aggregate, the data is used for improved EMT resuscitation training and feedback to manufacturers regarding software and hardware design.

II. Regional Purchasing Program

The **EMS Regional Purchasing Program** is a voluntary countywide program designed to reduce equipment and supply expenses by maximizing the joint purchasing power of EMS providers. Since its successful completion as a one-year pilot project in 1998, the program has been operating on a contractual basis with Life-Assist, Inc, the vendor providing the lowest overall bid for EMS supplies and equipment. The primary purchase order operates through King County Medic One and EMS agencies in King County are able to coat-tail on the contract through joint purchasing agreements.



An annual review of the cost savings during the May 1, 2003 - April 30, 2004 contract period with Life Assist, Inc.

was conducted. Comparisons were made between total agency expenditures and Life Assist, Inc. catalogue prices. Total agency expenditures from the Regional Purchasing Program continue to remain high, \$797,847 in the last contractual year with continued savings of over \$200,000. This program remains a shining example of how innovation and simplicity can produce exceptional results.

The Regional Purchasing Program is managed by an oversight committee that meets on a quarterly basis to address operational issues, review EMS products, and evaluate the status of the program. The direct administrative costs are minimal as product orders, agency invoicing, and shipping are all managed at the agency level.

The EMS Division and the Regional Purchasing Committee have developed a similarly designed **Regional Purchasing Program for Medications** that offers paramedics and EMTs a cost-savings option for purchasing patient medications in King County. Representatives from each of the paramedic programs met over a period of six months to develop a standardized medications list, and following Medical Program Directors review and approval, the EMS Division will put the purchase order out for a competitive bid. The program is expected to be in place by November 2004.

III. Emergency Medical Dispatch (EMD)

The EMS Division provides **Basic and Continuing Education Training** in Emergency Medical Dispatch (EMD) to approximately 175 emergency 9-1-1 dispatchers in King County. This training allows the dispatcher to appropriately triage callers so that the right level of care is sent to the patient. During the past year, 36 dispatchers from King County completed the 40-hour Basic EMD Training class. In addition, 152 dispatchers were provided 8 hours of Continuing Education in EMD related topics. The EMD Instructor Course (train-the-trainer) is being redesigned to meet the standards of a problem-based delivery. This course will be piloted in 2005. The *2002-2007 EMS Strategic Plan Update* identified a number of **enhancements to emergency medical dispatch**, focusing on enhanced dispatch training:

Basic Training: Changes to the EMD Basic curricula this year will focus on two areas. Additional training has been, and will continue to be, provided in the area of Basic Anatomy and Physiology to the dispatch students. This has been accomplished by adding one full day of training and testing prior to the existing 32-hour class. Another goal is to enhance the current 40-hour course to include more student application exercises and increase the students' participation in the learning process. This will be accomplished with role-play scenarios, simulation exercises, and other incorporated activities. This latter goal, development of a curriculum in a problem-based format, is in the development stage.

Continuing Education Training: To meet the 8-hour per year minimum requirement for continuing education, EMD training staff designed and developed several instructional modules for Emergency Medical Dispatchers. The Spring curriculum for 2003 focused on Chest Pain and Stroke, and the Fall 2003 class targeted Diabetes and special patient care issues not covered in the Quality Improvement Process. In the Spring of 2004, a web-based course on Cardiac Arrest

and Telephone CPR was piloted, supplemented with an in-class delivery of tape and scenario-based instruction.

Alternate Delivery Methods for Continuing Education Training: The objective of this project is to develop and deliver the continuing education curricula in a web-based format. This method of delivery has enabled the dispatchers to log on from their own Communications Center consoles and receive training at their convenience when call load volumes permit. This method of training is used only when appropriate for the desired lesson objectives and is expected to be a long-term project during this levy period. The first course was delivered in Spring 2004.

The **Telephone Referral Program** continues to provide emergency medical dispatchers in King County with an alternative method for handling non-urgent calls to 9-1-1. From January 1, 2003, to December 31, 2003, the 24-hour staffed nursing telephone line received 800 call referrals from 9-1-1 Call Receivers to the nurse line, including 472 calls from Valley Communications Center serving South King County, and 378 calls from Eastside Communications Center serving east and north King County. This program provides a safe and efficient way to handle minor medical emergencies that do not require Emergency Medical Technicians to respond to the scene.

V. Regional Medical Control

The **Medical Program Director** is responsible under the Washington Administrative Code (WAC) and Revised Code of Washington (RCW) for medical control and direction of certified EMS personnel in King County. This is accomplished through the delegation of medical oversight to the medical directors of individual paramedic programs and emergency room-based on-line medical control for ALS personnel. The Medical Program Director also assists in the development of policies and procedures related to the provision of ALS and BLS services, and provides written treatment guidelines for BLS personnel.

The Medical Directors' Committee, comprised of the medical directors from each ALS provider agency, provides generalized program oversight. The committee meets on a quarterly basis to address pertinent medical issues. Topics of interest often arise from discussions initiated as part of implementation of two Strategic Initiatives - 'Paramedic and EMT Procedure and Patient Treatment Evaluations' and 'Enhanced Care for Specific EMS Patients.' Specific areas of interest this year have been Pulse Oximetry, Glucometry, and Emesis in Cardiac Arrest (see page 28 for details).

VI. EMS Advisory Committee

The **EMS Advisory Committee** was formed in December 1997 and has met on a quarterly basis to discuss the progress of the strategic plan, review the development and implementation of the strategic initiatives, and act as a judicious forum for discussion of important EMS issues. The

committee played an integral role in development of the *2003 Supplemental Plan*, financial assessment of the EMS Sub-Funds, and review of the strategic initiatives.

This year, the EMS Advisory Committee played a critical role in the direction of Emergency Medical Services in King County by making recommendations to various political bodies concerning a few key EMS issues. These included implementation of the feasibility study in south King County, discussion of the periodic ALS allocation increases, and Strategic Initiative oversight. A copy of the current EMS Advisory Committee membership on the committee and their respective representation can be found in Appendix E on page 75.

VII. Cardiopulmonary Resuscitation (CPR) and Automated External Defibrillators (AED)

Seattle-King Community Responder AED Program: The goal of the Community Responder AED Program is to have all AED devices located in public places and private homes in King County registered with the EMS Division. The EMS Division keeps a registry with information on devices to provide dispatch agencies and fire departments with AED type and location. This information is then available when a cardiac arrest occurs in the community and 9-1-1 units respond to the scene.



The Community Responder AED Program is a cooperative effort between Seattle Fire Department and Public Health - Seattle & King County. The program was designed to assist businesses and private homes in implementing the appropriate training, placement, and registration of devices in compliance with the Washington State law concerning AEDs. This Public Access Defibrillation (PAD) program is continually growing. There are approximately 803 devices registered in the Community Responder AED Program as of July 2004.

SeaTac International Airport is one of the biggest sites to have AEDs in their facility. There are 250 devices placed throughout the airport with easy access to staff and lay responders. Public Health - Seattle & King County has AEDs in most Public Health Centers, the Medical Examiners Office and in the Jail Health locations at both criminal justice centers in Seattle and King County. Many local police units carry AEDs in their vehicles.

The outcome for cardiac arrest is thought to improve when an AED is used within a short time following collapse. A study conducted by the EMS Division showed the proportion of cardiac arrest patients treated by a public access AED has increased each year from .82% in 1999 to 2.05% in 2002.¹ The authors concluded that public access AED devices were used in a small, but increasing proportion of out-of-hospital cardiac arrests over the four-year study period. While the study was not designed to show improved outcomes from use of the devices, the results showed half of the 50 persons treated with a PAD device survived to hospital discharge.

Student CPR Program: The EMS Division conducts nationally-recognized American Heart Association training for school teachers and firefighters to become CPR Instructors. Last year, 15,646 students (grades 6-12) were trained in CPR in King County. The EMS Division contracted with nine school districts and six fire districts to provide CPR training in the schools. The fall and spring instructor training classes focused on the American Heart Association's CPR/AED and First Aid curriculum. The First Aid course has become very popular as teachers and fire fighters enjoy being able to teach CPR and First Aid as one course. Eighty AEDs have been placed in schools in King County. Funding for these devices is generally supplied by private or not-for-profit providers (Public Health does not fund the school devices).

King County Employee CPR Training Program: The goal of this program is to provide King County employees the training to assist in a life and death event should the occasion arise. This is accomplished by providing free CPR/AED training to all employees during their regular workday. The average number of County employees trained in CPR/AED each year is 3,000. Approximately, forty AEDs have been placed in King County-owned facilities.

Targeted CPR Training: The EMS Division works directly with several cardiologists in King County to provide CPR/AED training to patients considered high-risk for heart-related problems. The program offers in-home training for these citizens and their families and friends. CPR training is provided, and if an Automatic External Defibrillator has been assigned, the family also receives AED training. Last year, 32 people were trained in CPR and/or AED in their homes through this program.

¹ Culley LL, Rea TD, Murray JA, Welles B, Fahrenbruch CE, Olsufka M, Eisenberg MS, Copass MK. Public Access Defibrillation in Out-of-Hospital Cardiac Arrest: A Community-Based Study. *Circulation* 2004 Apr 20; 109(15):1859-63.

VIII. Critical Incident Stress Management (CISM) Program

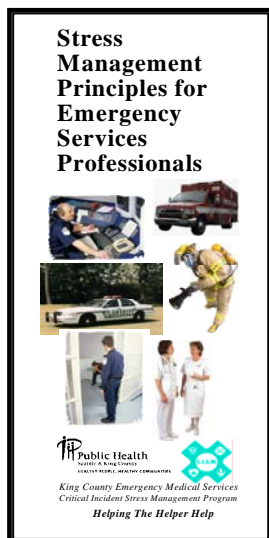


King County CISM Program celebrated its 15th year anniversary in 2003. It also saw the conclusion of its two year long self-assessment and CISM services evaluation. In 2001, questions were raised regarding the validity of CISM (debriefings) and the CISM movement in general. CISM staff and consultants reviewed over 100 articles and texts on the subject of critical incident stress management and debriefings. The primary focus of the effort was to identify the philosophy, strategies, and goals of the CISM and CISM services provided by the EMS

Division. A position and vision statement was published, and the program's motto - *Helping the Helper Help* - more than ever described the program's purpose of providing services to

individuals and agencies, and supporting other health management initiatives offered by King County CISM.

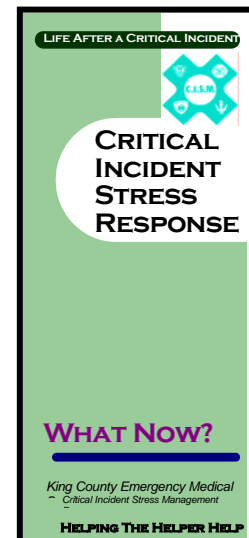
The position paper concluded that CISM services provided by peer emergency service professionals and mental health professionals to emergency service personnel and their families are based on a public health model of: *Primary Prevention* - Increasing resilience to extreme stressors; *Secondary Prevention* - Mitigating the impact of occupational exposure to extreme



stressors by incorporating Psychological First Aid; and *Tertiary Prevention* - Follow-up referrals for treatment when a higher level of support care beyond psychological debriefing/crisis intervention is required. A renewed vision brought about renewed informational and instructional materials.

The King County CISM program assists emergency services personnel, including police officers, firefighters, EMTs, paramedics, dispatchers, and corrections officers to remain psychologically healthy. The CISM program is supported by a team of 21 dedicated volunteer Peer Support Debriefers and Mental Health Professionals who donate their time to respond to post critical incident events. The EMS Division coordinates pre-incident stress

management classes and provides support to provider agencies' Peer Support Teams who provide immediate direct care to co-workers.



There were approximately thirty-eight post-incident CISM related requests during the year which included debriefings, defusings, one-on-one interventions, and referrals to mental health services. The King County CISM Team also participates in a Washington State and international network of CISM teams. The King County CISM staff continues to work with BLS Training and Education Section to provide EMTs with 'Crisis Intervention and Stress Management' as a part of their CBT curriculum.

Fire Chief Tom Barrett, a founding member of the King County CISM Team and charter CISM Advisory Board Member retired in 2003. He has contributed over 20 years to this cause.

IX. Administrative Functions

The EMS Division operates under the guidelines presented in various Master Plans, Master Plan Updates, and Strategic Plans, all approved by the King County Council. The process for updating these directives and implementing the specific programs identified in the plans requires significant data analysis and program coordination. An integral component of this analysis is the data modeling used to identify optimal placement of paramedic units.

The EMS Division is responsible for the coordination of services with the other divisions of Public Health - Seattle & King County in addition to other county agencies, councils, and offices, such as the Budget Office, Prosecuting Attorney, King County Executive, Risk Management, and the King County Council. Responsibilities also include the coordination and delivery of strategic planning, union negotiations, personnel and payroll issues, diversity management, legal compliance liability issues, contract administration, and the issuance and compliance of policies and procedures. The EMS Division administers contracts for five paramedic provider groups of Advanced Life Support Services (ALS), and for thirty-three Basic Life Support Provider (BLS) agencies located in King County. The EMS Division's administrative section is responsible for maintaining fiscal responsibilities for the EMS Division, including budget preparation and monitoring, projection of long term financial planning, and management of levy funds.

The EMS Division is also responsible for management of the Medical Incident Report Form (MIRF) data in compliance with Washington Administrative Code (WAC) 246-976-420. The EMS Division provides rapid response to data requests from external and EMS agencies in King County; provides data analysis and reports for pilot projects, EMS programs, and research projects; and supports network connectivity and management for EMS Division employees. Duties related to the oversight of this dataset include management of the cardiac database and the entire MIRF data warehouse system, collection and processing of over 120,000 MIRFs per year, and regular quality review of the EMS data set and data system. A quality assurance effort began in 2003 which relates hospital outcomes following cardiac arrest to service and resuscitation factors. The goal is to improve resuscitation rates and neurological outcomes.

D. Grant Funded Programs and Projects

I. Center for the Evaluation of Emergency Medical Services (CEEMS)

The Center for the Evaluation of Emergency Medical Services centers research efforts in the field of pre-hospital emergency care. CEEMS is supported by grants and staffed by investigators from the University of Washington and employees of the EMS Division. Known both nationally and internationally in the field of cardiac arrest, the investigators are continuously sharing their cutting edge research through numerous articles published in EMS and scientific journals.

A summary of the primary CEEMS activities of the past year is as follows:



Heart Attack Survival Kit (HASK) Program: The HASK Program is a National Institutes of Health (NIH) funded grant with the goal of increasing calls to 9-1-1 among seniors experiencing chest pain and increasing self-administration of aspirin. Twenty-seven thousand heart attack survival kits (identifying the symptoms of a heart attack and including a single aspirin) were delivered to seniors by emergency medical technicians (EMTs) in thirty of the thirty-four fire departments in King County. Along with the delivery of the kits, the EMTs spent about 3-5 minutes at home with the

seniors going over barriers they may have in calling 9-1-1 for chest pain and educating them about taking an aspirin once they have called 9-1-1.

Approximately half of the seniors were contacted at the time of the visit and the remainder received a kit in a plastic bag on their doorknob. The HASK Data collection of 9-1-1 calls and aspirin use prior to EMS arrival for chest pain complaints ended December 31, 2003. Data analysis and final report writing are currently underway and the study is expected to be funded through the end of 2004.

Preliminary results of the HASK trial suggest that using EMS personnel may be an effective model for favorably influencing behavior among older adults experiencing symptoms of cardiac chest pain. The intervention showed a statistically significant increase in 9-1-1 calls for chest pain as well as aspirin use for such symptoms among seniors in King County, Washington. The effect was maintained over 2 years following the intervention, at least for calling 9-1-1, suggesting that this relatively labor-intensive intervention produced short as well as longer term effects on behavior.

The HASK findings are especially significant in a research field that for decades has spent literally hundreds of thousands of dollars in attempting to design public education interventions to educate the public in recognizing the signs and symptoms of a heart attack and how to act appropriately without finding positive results. The HASK study had two main advantages over other approaches that have been tried to date. First, the use of the kit as a vehicle for the message makes the somewhat abstract message tangible. This tangible product, attractive and useful enough to keep somewhere visible, will function as a continuous reminder of how to respond appropriately to a heart emergency long after the intervention is over. Second, the interpersonal nature of kit delivery was thought to enhance the credibility and persuasiveness of the message.

The At Home Study: The AED Training in the Home study has been funded by NIH and began in April 2004. The randomized controlled trial study will evaluate four types of AED training on 300 families of high risk patients recruited from hospitals in King County following coronary syndrome admissions. The study will determine the most effective training method in terms of skills retention and psychological impact on both patient and family member(s).

Cardiac Arrest Outcomes: This is a privately funded grant that involves interviewing survivors of cardiac arrest and review of hospital medical records. The goal is to evaluate the care and outcome of survivors of cardiac arrest in King County to determine whether current practice at community hospitals regarding implanted defibrillators is consistent with American Heart Association and American College of Cardiology guidelines. The study is expected to start in September 2004.

The Resuscitation Consortium: The National Institutes of Health (NIH) recently funded the building of a consortium of select communities across North America to evaluate important research questions involving pre-hospital care. The agenda will consist of evaluating EMS care for life-threatening trauma and cardiac arrest. Seattle/King County has been identified as one of the select participating communities.

II. Central Region Emergency Medical Service and Trauma Care Council

Traumatic injury is the leading cause of death for all people under the age of 44 and the leading cause of disability for all people under age 65. In 2003, Central Region (King County) hospitals treated 6,438 persons with injuries severe enough to require hospitalization, 314 of those patients died.

The Central Region's jurisdiction equates to King County boundaries as established by The Statewide Emergency Medical Services and Trauma Care System Act of 1990 (RCW 70.168). Over the past fourteen years, the Trauma Council has worked with local hospitals and EMS agencies to incorporate the elements mandated by the act into the local EMS and trauma care system. Achievements for 2004 include:



- Awarded a \$5,000 grant to 'Docs, Cops, and Bullies,' a program developed by medical professionals and police to encourage student reporting of weapon carrying and bullying within schools.
- Awarded a \$5,000 grant for 'Smart Kids! Safe Kids!,' an injury prevention curriculum that pre-school teachers can use to teach children head/helmet safety, poison prevention, pedestrian safety, and scalds/burn safety (see page 29 for more details).
- Through a partnership with Washington State Department of Health and HRSA, three Automatic External Defibrillators (AEDs) were donated to Washington State Patrol units operating in the Skykomish area, and one AED was given to Steven's Pass Ski Patrol.
- Awarded a \$4,370 grant to the EMS Division Training Section for development of web-based trauma training.
- Amended Patient Care Procedures (PCPs) to define the circumstances in which private ambulances can travel code red (lights and sirens). This amendment was requested by the Medical Program Director in King County in response to an incident involving a private ambulance collision with a private vehicle. The driver of the car was killed and the passenger severely injured. The private ambulance was transporting a non-emergent patient code-red to a local hospital. The amended PCPs disallow private BLS ambulance to travel code red unless mandated by contract or requested by ALS providers at the scene. The revised PCPs became effective May 1, 2004 following review and approval by the Governor's EMS and Trauma Steering Committee. The Trauma Council is monitoring the effect of this change on out-of-service times that may result when the primary responding EMS unit has to wait for private ambulance to arrive on scene and transport a patient.
- Reviewed trauma system data and made recommendations to the State Department of Health on the number and level of trauma centers needed in the region. This year the Trauma Council recommended adding a level V trauma center.

- The Central Region Trauma Registry developed two important studies in trauma care in the region:
 - Transfers in the Central Region Trauma Registry: Changes Over Time 1995-2003. This report supported the Washington State Medical Association and the Washington State Hospital Association efforts to address access to healthcare issues.
 - Traumatic Brain Injuries in the Washington State Central Region Trauma Registry: 1995-2002. This study helped to better define traumatic brain injury and changes in treatment in the region.

Trauma Regions are grant-funded through the Washington State Department of Health. The current contract expires in June 2005.

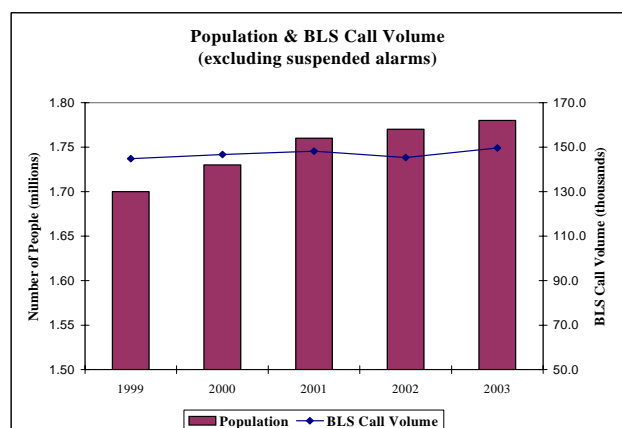
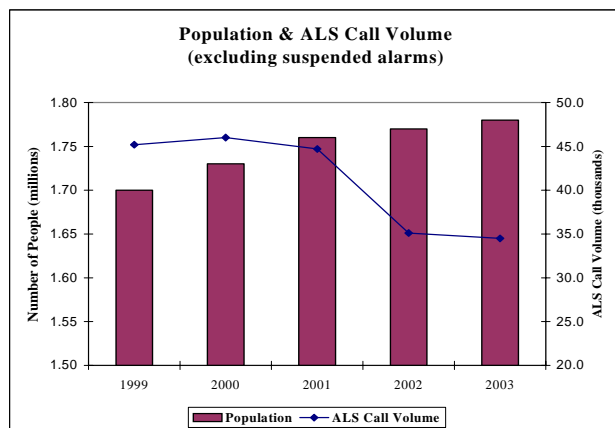
Summary of 2003 EMS Statistics (Seattle and King County)*

The following statistics are derived from the data collected on the Medical Incident Report Forms (MIRFs) and submitted by EMS agencies to the EMS Division for the year 2003.

<u>Population</u>	<u>Seattle- King County</u>	<u>% Growth</u>
1980	1,269,898	
1990	1,507,305	18.7% (10 yr)
2000	1,730,504	14.8% (10 yr)
2001	1,758,321	1.6% (1 yr)
2002	1,774,300	0.9% (1 yr)
2003	1,779,300	0.3% (1 yr)

Over the past two decades, population growth in King County has remained well above an average rate of 1% per year. In 2002, the yearly rate of increase declined to just under 1% and the rate continued to decline in 2003. Population has often been a factor in EMS call volume growth. The two graphs below depict the population growth relative to both BLS and ALS call volume patterns. Of interest is the continued three-year actual decline in ALS calls volumes due in part to the success of the ALS Dispatch Criteria Revisions (see page 22).

Note that the scales for population and call volumes are different.



Operations:

Number of Responses

ALS

48,963

BLS

152,619

Average Response Time

ALS

10.8 minutes / 7.4 minutes

BLS

5.8 minutes / 5.0 minutes

6 Minutes or less

72.9% / 81.8%

8 Minutes or less

47.3% / 69.8%

10 Minutes or less

62.0% / 84.7%

12 Minutes or less

72.3% / 92.3%

14 Minutes or less

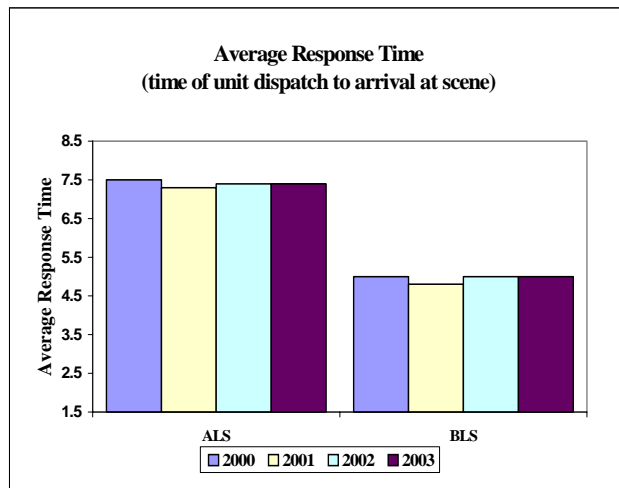
79.0% / 95.9%

Suspended Alarms

29.6%

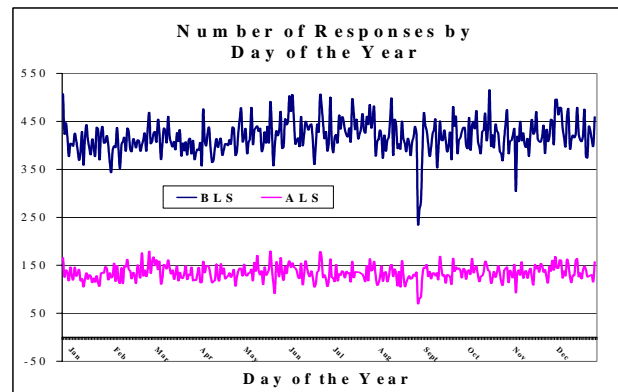
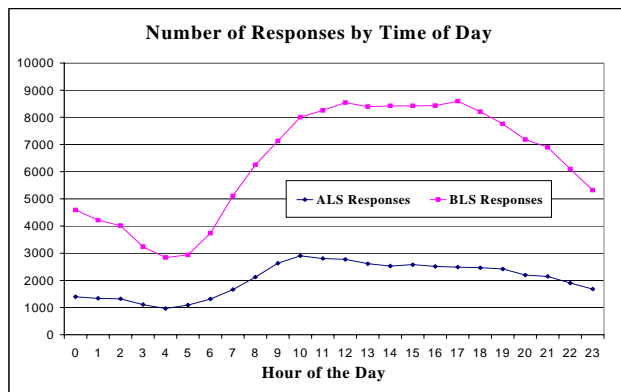
2.0%

*The 2003 EMS data uses a fully integrated EMS Division and Seattle dataset, although a comparison of data between years may be limited. Response times are defined as follows: the time of call arrival at dispatch to the time of arrival at the scene / the time of unit dispatch to time of arrival at the scene. In some instances, totals differ due to missing values.



Despite the continued growth in population and call volumes over time, the average BLS unit response times have remained relatively even. In the case of ALS response times, the average remained steady last year as depicted in the graph to the left.

The two graphs located directly below reflect the patterns of ALS and BLS response during the day and throughout the year. Of note is the difference in range of BLS responses per day over time (~230-510 calls) in comparison to ALS responses (~70-180 calls).

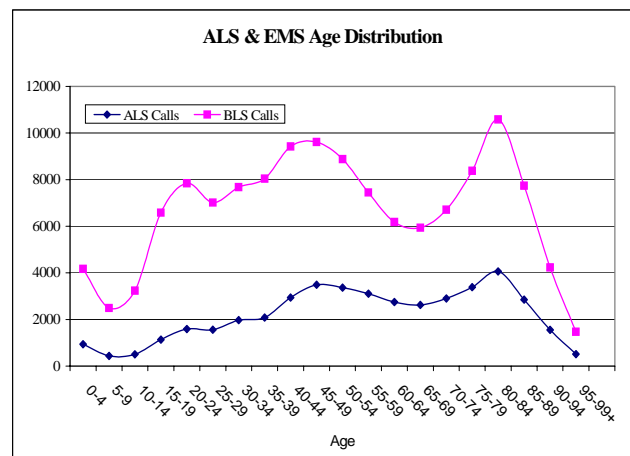


Characteristics of Responses:

The following information reflects a variety of statistics that characterize the types of both BLS and ALS calls, including a comparison of age groups, types of medical complaints, where incidents take place, and patient transport information. Paramedics providing advanced life support are more likely to attend to older patients for cardiac conditions, while EMTs often tend to trauma in young adults.

Responses by Age Group:

	<u>ALS</u>	<u>BLS</u>
0-17 yrs	2,481 (5.7%)	13,349 (10.0%)
18-24 yrs	2,126 (4.9%)	10,984 (8.2%)
25-44 yrs	8,559 (19.6%)	32,148 (24.1%)
45-64 yrs	12,713 (29.0%)	32,113 (24.0%)
65+ yrs	17,898 (40.9%)	45,051 (33.7%)
Total	43,777	133,645



Responses by Type:

Cardiac
Neurologic
Respiratory
Trauma
Abdominal/GU
Metabolic / Endocrine
Other Illness

ALS

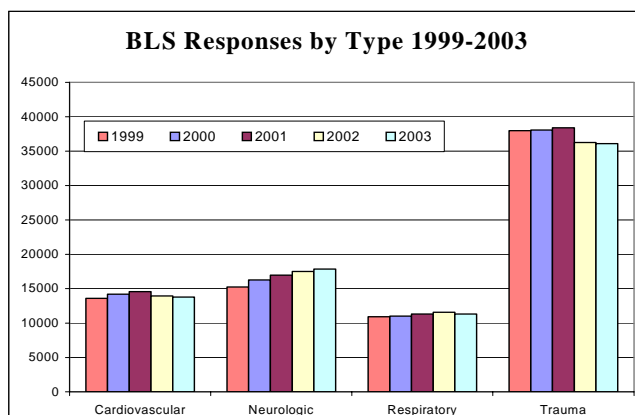
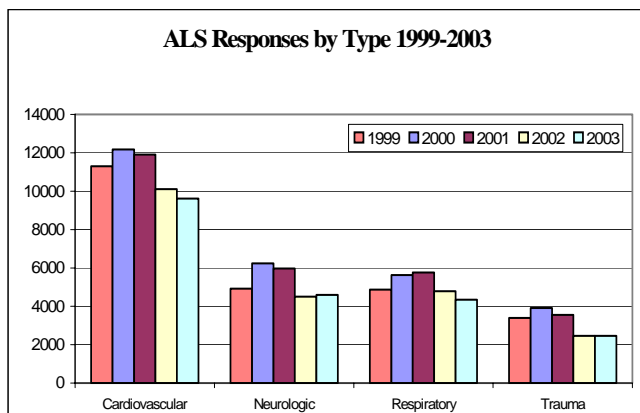
9,614 (29.9%)
4,598 (14.3%)
4,343 (13.5%)
2,461 (7.6%)
1,897 (5.9%)
1,914 (5.9%)
7,377 (22.9%)

BLS

13,774 (11.1%)
17,848 (14.3%)
11,318 (9.1%)
36,102 (29.0%)
8,810 (7.1%)
3,733 (3.0%)
32,936 (26.5%)

Total**32,204****124,521**

Although ALS and BLS personnel each respond more frequently to particular types of calls (i.e. cardiac calls for ALS and trauma for BLS), the EMS community serves a wide variety of medical emergencies. This aspect requires not only an in-depth knowledge of specific invasive medical procedures but also requires a considerable breadth of knowledge and skills for diagnoses and management.



Similar to the variation reflected in the types of responses EMS agencies provide, EMS personnel respond to a variety of physical settings, again requiring a versatility of skills. For example, providers may respond to settings where they need to interact with other medical professionals or need to deliver patient care on a busy street or highway. Alternatively, EMS personnel respond to public settings where they may need to not only deal with the patient but also the public. This response sometimes requires cooperation and collaboration with other public safety personnel such as police officers and security guards.

Incident Locations:

Home/Residence
Nursing Home
Clinic / MD Office
Street/Highway
Other/Unknown Location

ALS

23,967 (59.5%)
2,616 (6.5%)
1,841 (4.6%)
1,953 (4.8%)
9,872 (24.5%)

BLS

71,053 (53.7%)
6,171 (4.7%)
2,770 (2.1%)
16,799 (12.7%)
35,440 (26.8%)

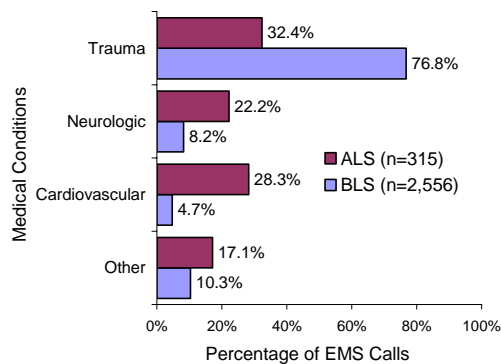
Total**40,259****132,233**

ALS/BLS Highlight: EMS and Sports Emergencies

The Emergency Medical Services (EMS) system in King County provides care to people calling 9-1-1 from playfields, recreation centers, and other sports locations. These patients are treated by BLS and/or ALS personnel depending on the type of medical condition and presenting level of severity. For example, some calls consist of a badly sprained ankle during a soccer game, while others involve a heart attack triggered from overexertion on a basketball court.

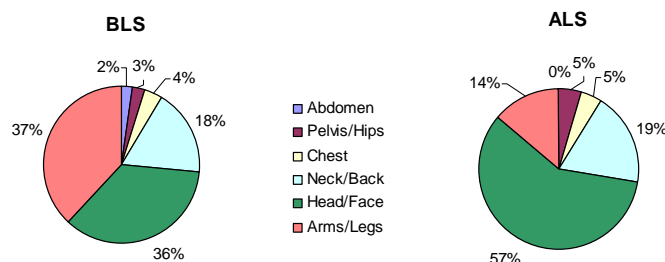
Although the level of care for a call is always determined on a case by case basis, there are some trends in the types of cases that EMS responders typically see. As shown in Figure 1, over three-quarters of the cases treated by BLS personnel were trauma cases. In contrast, traumas accounted for less than one-third of the calls requiring ALS services from recreation areas. ALS agencies were more likely than BLS agencies to respond to calls for neurological or cardiovascular emergencies.

Figure 1: Types of Calls from Recreation/Sport Locations



Another key distinction between the care provided by BLS and ALS personnel is the rate at which different types of trauma from recreation locations are treated. As shown in Figure 2, more than half (57%) of the ALS calls involved a head or face injury, in contrast to 36% of BLS calls. Over one-third (37%) of the traumas to which BLS agencies responded had arm or leg injuries, while 14% of the ALS calls involved arm or leg injuries.

Figure 2: Types of Trauma Calls from Recreation/Sport Locations



The EMS system in King County strives to provide the most appropriate and efficient emergency medical care possible. One of the critical elements in this process is the rapid and accurate medical assessment by dispatchers. Once dispatched, EMS personnel provide timely and expertly delivered treatment at the scene based on skilled evaluation and selection of post-treatment transport options.

Cardiac Arrest Statistics:

The Cardiac Arrest Surveillance System (CASS) has evaluated cardiac arrest statistics for almost thirty years (see page 39 for more details about the Center of Evaluation of EMS). Similar data is collected within the City of Seattle. The following information depicts the combined cardiac arrest survival rates.

CPR Initiated by Bystander:

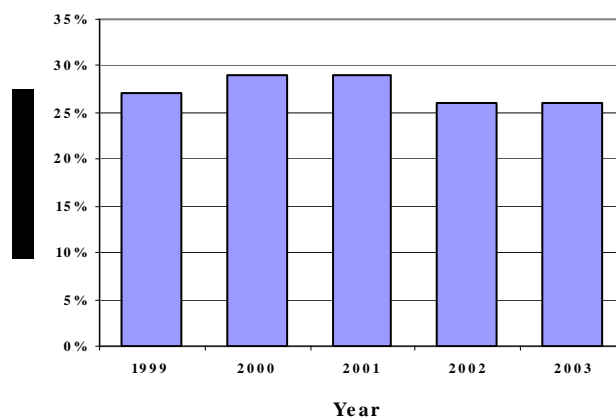
<u>Year</u>	<u>Rate</u>
2003	500/993 (50%)
2002	540/1097 (49%)

Cardiac Survival Rate: *

<u>Year</u>	<u>Rate</u>
2003	72/260 (28%)
1999-2003	446/1586 (28%)

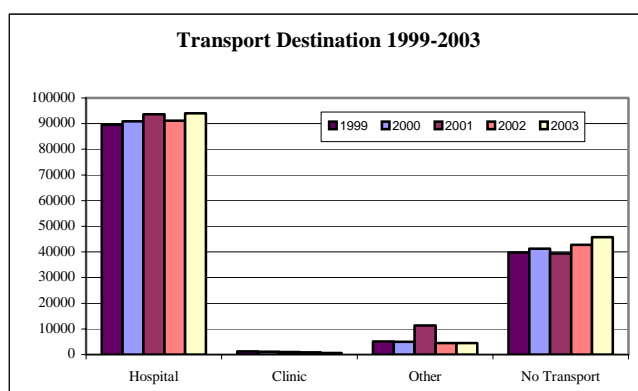
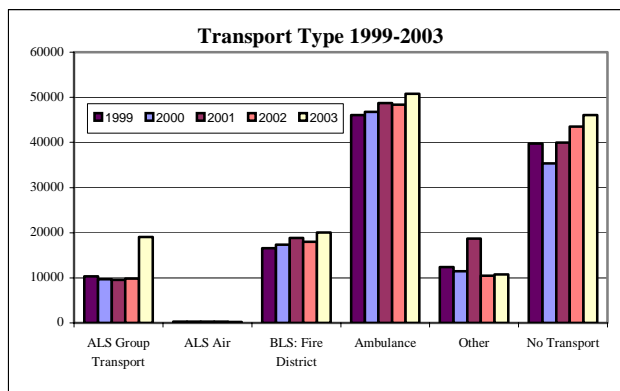
* Definition: discharged from hospital alive / treated patients in cardiac arrest on arrival of EMS, with a rhythm of ventricular fibrillation.

**Percent Survival From Ventricular Fibrillation
Cardiac Arrest, Seattle and King County**



Transport Type and Destination:

An important component of providing EMS care is appropriate triage. EMS personnel uses their skills and knowledge to match the clinical need of the patient with the most appropriate transport and destination plan. The figures below reflect the transport trends over the past five years.

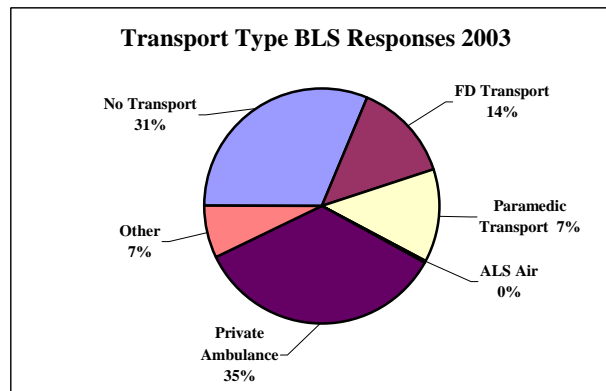
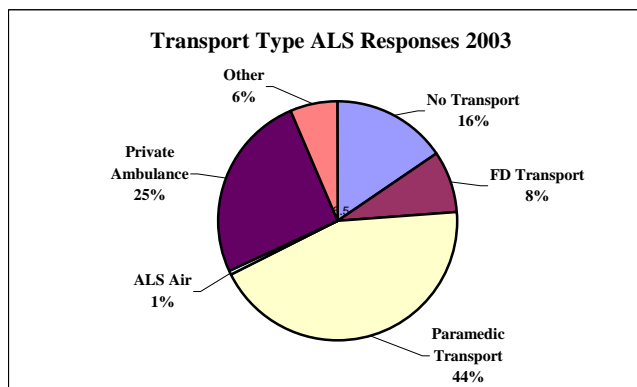


Transport Type:

ALS Transport	19,033 (13.0%)
ALS Air	224 (0.2%)
BLS - Fire District	20,025 (13.6%)
BLS - Ambulance	50,824 (34.6%)
Other	10,796 (7.3%)
No Transport	46,046 (31.3%)
Total	146,948

Transport Destination:

Hospital	93,964 (64.9%)
Clinic	685 (0.5%)
Other	4,532 (3.1%)
No Transport	45,704 (31.5%)
Total	144,885



CPR Highlight: EMS Calls to Cardiac Arrest for Persons with Do Not Resuscitate Orders - A Dilemma

Efficient use of emergency medical services requires that it be used for patients with urgent medical conditions for whom useful interventions can be made. Despite the presence of signed Do Not Resuscitate (DNR) orders, some staff members in nursing homes, adult family homes and assisted living centers call 9-1-1 when a resident experiences cardiac arrest.

To determine the magnitude of EMS use in these situations, we undertook a retrospective case review. To find the reasons why EMS is called for nursing home residents in cardiac arrest with DNR orders, we conducted a telephone survey of facilities to determine their policies for calling 9-1-1. We found that **29 of 139 residents in cardiac arrest (21%)** who had DNR orders had CPR by EMS. Most of the calls to 9-1-1 came from adult family homes, and none of the 29 residents survived. Results of the telephone survey by type of facility are as follows:

	Nursing Homes n=30	Assisted Living/Adult Family Homes n=36
Would call 9-1-1 for residents with DNR orders	4 (13%)	34 (94%)
Would check for presence of DNR before calling	26 (28%)	3 (8%)
Would start CPR for residents with DNR orders	2 (7%)	16 (44%)

In the nursing homes, the interviewees said a reason for calling 9-1-1 was a concern for the validity of the orders for persons just transferred to their facility. Other reasons were poor staff training and use of temporary staff. In the adult family homes, nearly all the interviewees said they wanted paramedics to confirm death, feeling that they would be out of compliance with regulations if they did not.

Residents with DNR orders in long-term care facilities should receive compassion and respect for their wishes. To help prevent unwanted and inappropriate use of EMS, the Community Programs section has developed a videotape designed for nursing homes and adult family homes. It clarifies when it is appropriate to call 9-1-1. EMS personnel are visiting nursing homes and viewing it with the staff.

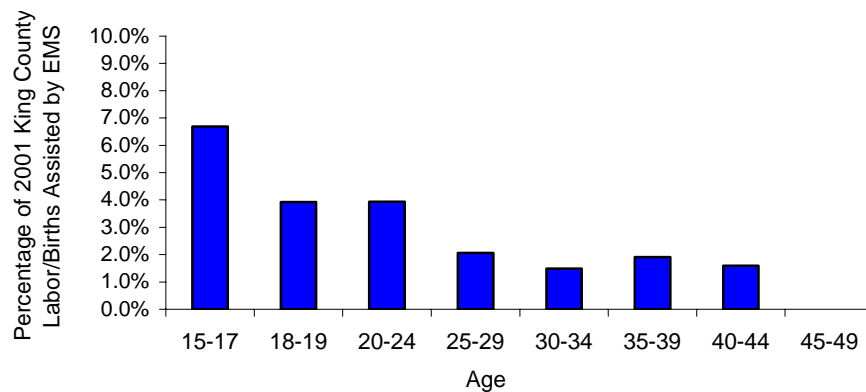
Public Health Highlight: EMS and Teen Pregnancy

Teen pregnancy is a serious public health issue due to the adverse health, social, and economic risks to which teen mothers and their children are exposed. Much of this excess morbidity and mortality occurs during the perinatal period. Ideally, higher risk births occur in a controlled hospital setting.

The involvement of emergency medical services (EMS) during labor and delivery represents an unfavorable circumstance where optimal control and care is challenging. We evaluated how often EMS are involved in labor and delivery according to age groups.

As shown in the figure below, the proportion of births that involved EMS was greater for females ages 15 to 17 than for any other age group. The proportion of births involving EMS decreased steadily as age increased. Females 15-17 were more than twice as likely to require EMS during labor or delivery compared to older women.

Figure: King County Births and Labor and Delivery EMS Calls according to Age - 2001



Age (Years)	15-17	18-19	20-24	25-29	30-34	35-39	40-44	45-49
Births	359	868	3,690	5,381	6,848	3,731	819	42
EMS labor or delivery calls	24	34	145	111	102	71	13	0
Percentage of births that received EMS assistance	6.7%	3.9%	3.9%	2.1%	1.5%	1.9%	1.6%	0.0%

In summary, the elevated risk of teen pregnancy appears to be in part reflected by the additional involvement of EMS during labor and delivery. Thus, ongoing evaluation of teen pregnancy rates and outcomes remain an important public health activity. Recently, Public Health - Seattle & King County issued an encouraging report of teen pregnancy in King County (Public Health Data Watch, Vol 6, No 1 - *Adolescent Pregnancy, Birth and Abortion, King County, 1980-2001*). The report documents a substantial decrease in the rates of teen birth, pregnancy, and abortion from 1980 to 2001.